CLAIMS

Claims 22 and 27 are being amended. All pending claims are reproduced below, including those that remain unchanged.

1. (Previously Presented) A method for improving servo demodulation robustness in a disk drive system having a read channel including a variable gain amplifier (VGA), the method comprising:

(a) producing an amplitude error signal by comparing a measured servo signal amplitude to a target amplitude;

(b) filtering the amplitude error signal to produce an automatic gain control (AGC) signal useful as feedback to the variable gain amplifier (VGA) of the read channel; and

(c) limiting the AGC signal to keep it within a desired range, before providing the AGC signal as an input to the VGA;

wherein the desired range includes at least one of an upper limit and a lower limit.

2. (Original) The method of claim 1, further comprising, prior to step (a):

reading a servo wedge and producing a servo signal therefrom; and

measuring an amplitude of the servo signal.

3. (Original) The method of claim 1, wherein the disk drive system includes a plurality of heads, and wherein the desired range is dependent at least in part on which head is being used to read a servo wedge.

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4. (Original) The method of claim 1, wherein the disk drive system includes a zone bit recorded disk including a plurality of zones, and wherein the desired range is dependent at least in part on which zone is being read.

5. (Previously Presented) The method of claim 1, wherein the desired range is dependent at least in part on:

which head, of a plurality of heads, is being used to read a servo wedge; and

which zone, of a plurality of zones, the servo wedge is within.

6. (Previously Presented) A method for improving servo demodulation robustness in a disk drive system having a read channel including a variable gain amplifier (VGA), the method comprising:

(a) producing an amplitude error signal by comparing a measured servo signal amplitude to a target amplitude;

(b) filtering the amplitude error signal to produce an automatic gain control (AGC) signal useful as feedback to the variable gain amplifier (VGA) of the read channel; and

(c) limiting the AGC signal to keep it within a desired range, before providing the AGC signal as an input to the VGA;

wherein step (b) includes

(b.1) filtering the amplitude error signal using a digital filter including an integration path; and

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(b.2) limiting the integration path within the digital filter to thereby prevent integral windup.

7. (Original) The method of claim 1, wherein step (c) includes limiting an output path of the digital filter to keep the servo AGC signal within the desired range.

8. (Previously Presented) A method for improving servo demodulation robustness in a disk drive system having a read channel including a variable gain amplifier (VGA), the method comprising:

(a) producing an amplitude error signal by comparing a measured servo signal amplitude to a target amplitude;

(b) filtering the amplitude error signal to produce an automatic gain control (AGC) signal useful as feedback to the variable gain amplifier (VGA) of the read channel; and

(c) limiting the AGC signal to keep it within a desired range, before providing the AGC signal as an input to the VGA;

wherein step (c) includes

(c.1) comparing each servo automatic gain control (AGC) value, of the servo AGC signal, to an upper limit and a lower limit;

(c.2) if the servo AGC value is above the upper limit, limiting the servo AGC value to the upper limit; and

(c.3) if the servo AGC value is below the lower limit, limiting the servo AGC value to the lower limit.

9. (Canceled)

10. (Original) A method for improving servo demodulation robustness, comprising:

(a) comparing a servo automatic gain control (AGC) value to an upper limit and a lower limit;

(b) if the servo AGC value is above the upper limit, limiting the servo AGC value to the upper limit; and

(c) if the servo AGC value is below the lower limit, limiting the servo AGC value to the lower limit.

11. (Previously Presented) A method for improving servo demodulation robustness in a disk drive system having a read channel, the method comprising:

(a) producing a phase error signal by comparing a measured servo signal phase to a target phase;

(b) filtering the phase error signal to produce a servo phase lock loop (PLL) signal useful as feedback to an oscillator; and

(c) limiting the PLL signal to keep it within a desired range, before providing the PLL signal as an input to the oscillator;

wherein the desired range includes at least one of an upper limit and a lower limit.

12. (Original) The method of claim 11, further comprising, prior to step (a):

reading a servo wedge and producing a servo signal therefrom; and

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measuring a phase of the servo signal.

13. (Original) The method of claim 11, wherein the disk drive system includes a plurality of heads, and wherein the desired range is dependent at least in part on which head is being used to read a servo wedge.

14. (Original) The method of claim 11, wherein the disk drive system includes a zone bit recorded disk including a plurality of zones, and wherein the desired range is dependent at least in part on which zone is being read.

15. (Original) The method of claim 11, wherein the desired range is dependent at least in part on:

which head, of a plurality of heads, is being used to read a servo wedge; and

which zone, of a plurality of zones, the servo wedge is within.

16. (Previously Presented) A method for improving servo demodulation robustness in a disk drive system having a read channel, the method comprising:

(a) producing a phase error signal by comparing a measured servo signal phase to a target phase;

(b) filtering the phase error signal to produce a servo phase lock loop (PLL) signal useful as feedback to an oscillator; and

(c) limiting the PLL signal to keep it within a desired range, before providing the PLL signal as an input to the oscillator;

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wherein step (b) includes

(b.1) filtering the PLL signal using a digital filter including an integration path; and

(b.2) limiting the integration path within the digital filter to thereby prevent integral windup.

17. (Original) The method of claim 11, wherein step (c) includes limiting an output path of the digital filter to keep the servo PLL signal within the desired range.

18. (Previously Presented) A method for improving servo demodulation robustness in a disk drive system having a read channel, the method comprising:

(a) producing a phase error signal by comparing a measured servo signal phase to a target phase;

(b) filtering the phase error signal to produce a servo phase lock loop (PLL) signal useful as feedback to an oscillator; and

(c) limiting the PLL signal to keep it within a desired range, before providing the PLL signal as an input to the oscillator;

wherein step (c) includes

(c.1) comparing each servo PLL value, of the servo PLL signal, to an upper limit and a lower limit;

(c.2) if the servo PLL value is above the upper limit, limiting the servo PLL value to the upper limit; and

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(c.3) if the servo PLL value is below the lower limit, limiting the servo PLL value to the lower limit.

19. (Canceled)

20. (Previously Presented) A method for improving servo demodulation robustness, comprising:

(a) comparing a servo phase lock loop (PLL) value to an upper limit and a lower limit;

(b) if the servo PLL value is above the upper limit, limiting the servo PLL value to the upper limit; and

(c) if the servo PLL value is below the lower limit, limiting the servo PLL value to the lower limit.

21. (Previously Presented) A method for improving servo-demodulation robustness, comprising:

(a) reading a servo wedge;

(b) determining a servo automatic gain control (AGC) value corresponding to the servo wedge;

(c) storing the servo AGC value in a register;

(d) if the servo AGC value stored in the register is outside a desired range, replacing the servo AGC value stored in the register with a value that is within the desired range; and

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(e) using the servo AGC value stored in the register as, or to predict, a starting AGC value when beginning to read a next servo wedge.

22. (Currently Amended) The method of claim 21, wherein the desired range includes an upper limit value and a lower limit value, and wherein step (d) comprises:

(d.1) comparing the servo AGC value stored in the register to the upper limit value and to the lower limit value;

(d.2) if the servo AGC value is above the upper limit value, replacing the servo AGC value stored in the register with the upper limit value; and

(d.3) if the servo AGC value is below the lower limit value, replacing the servo AGC value stored in the register with the lower limit value.

23. (Original) The method of claim 21, wherein the disk drive system includes a plurality of heads, and wherein the upper limit value and the lower limit value is dependent at least in part on which head is being used to read a servo wedge.

24. (Original) The method of claim 21, wherein the disk drive system includes a zone bit recorded disk including a plurality of zones, and wherein the upper limit value and the lower limit value is dependent at least in part on which zone is being read.

25. (Original) The method of claim 21, wherein the upper limit value and the lower limit value are dependent at least in part on:

which head, of a plurality of heads, is being used to read a servo wedge; and

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which zone, of a plurality of zones, the servo wedge is within.

26. (Original) A method for improving servo-demodulation robustness, comprising:

(a) reading a servo wedge;

(b) determining a servo phase lock loop (PLL) value corresponding to the servo wedge;

(c) storing the servo PLL value in a register;

(d) if the servo PLL value stored in the register is outside a desired range, replacing the servo PLL value stored in the register with a value that is within the desired range; and

(e) using the servo PLL value stored in the register as, or to predict, a starting servo PLL value when beginning to read a next servo wedge.

27. (Currently Amended) The method of claim 26, wherein the desired range includes an upper limit value and a lower limit value, and wherein step (d) comprises:

(d.1) comparing the servo PLL value stored in the register to the upper limit value and to the lower limit value;

(d.2) if the servo PLL value is above the upper limit value, replacing the servo PLL value stored in the register with the upper limit value; and

(d.3) if the servo PLL value is below the lower limit value, replacing the servo PLL value stored in the register with the lower limit value.

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28. (Original) The method of claim 27, wherein the disk drive system includes a plurality of heads, and wherein the upper limit value and the lower limit value is dependent at least in part on which head is being used to read a servo wedge.

29. (Original) The method of claim 27, wherein the disk drive system includes a zone bit recorded disk including a plurality of zones, and wherein the upper limit value and the lower limit value is dependent at least in part on which zone is being read.

30. (Original) The method of claim 27, wherein the upper limit value and the lower limit value are dependent at least in part on:

which head, of a plurality of heads, is being used to read a servo wedge; and

which zone, of a plurality of zones, the servo wedge is within.

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